

## REMARKS

In the Office Action, claims 1-11, 14, 16-18, and 27-30 were rejected under 35 U.S.C. § 102(b) as being anticipated by USP 5,649,165 issued to Jain et al. (Jain). Claims 12, 13, 15, and 19 were also rejected under 35 U.S.C. § 103(a) as being unpatentable over Jain in view of USP 6,301,687. In this Amendment, Applicants have amended claim 1 and have added new claims 31-43. Accordingly, claims 1-43 will be pending after entry of this Amendment.

### I. Amendment to the Specification and Drawings

In this Amendment, Applicants have corrected four typographical errors in the drawings and three typographical errors in the specification. No new matter had been added, as all the corrections are supported by the discussion in the specification and by the illustrations in the figures. Specifically, Applicants moved an arrow that previously pointed to operation 660 in the flowchart illustrated in Figure 6B to now point to the operation 655. This change is supported by (1) the referenced transition from 615 to 655 in Figure 6A, (2) the discussion in the specification on page 34, lines 5-7, and (3) the discussion in the specification on page 34, lines 8-22, which provides the rationale as to why the process 600 of Figure 6 transitions to 655 from 615 and 645.

Applicants also corrected the description of the operation 1445 in Figure 14. This correction is supported by the description in the specification on page 51, lines 15-17. In addition, Applicants added a transitional arrow to operation 2228 on Figure 22B. This correction is supported by the description in the specification on page 72, lines 14-15. Applicants also corrected the numbering of operation 2246 in Figure 22C. This correction is supported by the description in the specification on page 72, lines 19-20.

In the specification on page 31, Applicants changed an inaccurate reference to a transition from 615 to 660 in Figure 6B, to an accurate reference regarding a transition from 615 to 655. As mentioned above, this change is supported by (1) the referenced transition from 615 to 655 in

Figure 6A, (2) the discussion in the specification on page 34, lines 5-7, and (3) the discussion in the specification on page 34, lines 8-22, which provides the rationale as to why the process 600 of Figure 6 transitions to 655 from 615 and 645.

On page 72, line 13, Applicants have also changed "2242" to "2202." This is a reference number for the operation that the process 2200 of Figures 22A-22C performs to generate several graphs. As mentioned in the specification on page 65, line 1 to page 66, line 16, the process 2200 generates these graphs at 2202. *See also* page 70, lines 15-17. Finally, on page 73, lines 2-3, Applicants have changed "[a]fter 2244, the process ends," to "[a]fter 2246, the process ends." As shown in Figure 22C, the process 2200 ends after it completes the database tables; as specified in the specification, the process 2200 completes the database tables at 2246, which proceeds 2244 in Figure 22C. *See* page 72, lines 19-20.

## **II. Amendment of Claim 1**

In this Amendment, Applicants have amended claim 1 to resolve an indefiniteness issue. Specifically, claim 1 recites two sub-networks, a candidate sub-network and a replacement sub-network. As filed, Claim 1 recited a method that identifies "a set of output functions performed by the sub-network." Applicants have amended claim 1 to clarify that the identified set of functions are the set of output functions of the candidate sub-network.

## **III. Claims 1-5**

Claims 1-5 stand rejected under § 102(b) as being anticipated by Jain. Applicants respectfully traverse this rejection.

Each of the claims 1-5 recites a method that produces a circuit description of a design by:

- (a) selecting a candidate sub-network from the design;
- (b) identifying a set of output functions performed by the sub-network;
- (c) based on the identified set of output functions, retrieving a replacement sub-

network from a storage structure that stores replacement sub-networks;

(d) determining whether to replace the selected candidate sub-network with the replacement sub-network in the design;

(e) replacing the selected candidate sub-network with the replacement sub-network in the design when the method determines to replace the selected candidate sub-network.

Applicants respectfully submit that Jain does not disclose, teach, or even suggest a method that produces a circuit description of a design. Accordingly, Jain does not disclose, teach, or even suggest many of the limitations of the claimed methods of claims 1-5. For instance, Jain does not disclose, teach, or even suggest replacing in the design a candidate sub-network with a replacement sub-network, which is retrieved from a storage structure based on the identified set of output functions of the candidate sub-network.

Instead, Jain discloses logic verification systems that verify whether two circuits are logically equivalent. *See, e.g.*, the Jain's Summary, which specifies that Jain's systems perform logic design analysis for identifying logical interdependencies between logic gates, and logic design verification for verifying logical equivalency of circuits through a variety of techniques, such as BDD simplification.

Applicants respectfully submit that the paragraph cited by the Examiner for the proposition that Jain discloses a method for replacing one sub-network with another (i.e., submit that the cited paragraph on column 24, lines 50-65), does not disclose, teach, or even suggest such a replacement. The cited paragraph is part of Jain's section regarding "Logic Design Verification Using BDD Simplification," which starts on column 21, line 50 and ends on column 26, line 10. The thrust of this section is about verifying whether two circuits are logically equivalent (see steps 385 and 386 of Figure 32B) by performing BDD simplification. The cited

paragraph on column 24, lines 50-65, has to do with a "successive compose operation" (at 380) that is performed when a composite circuit H (which is obtained at 368 by performing a Boolean XOR of the two examined circuits F and G) is deemed too large. This paragraph does not disclose, teach, or even suggest replacing one sub-network in the design with another sub-network. Accordingly, Applicants request reconsideration and withdrawal of the § 102(b) rejection of claims 1-5.

#### **IV. Claims 6-19 and 27-30**

Claims 6-30 stand rejected under § 102(b) or § 103 as being anticipated by Jain or rendered unpatentable by the combination of Jain and USP 6,301,687. Applicants respectfully traverse these rejections.

Each of the claims 6-30 recites a method that produces a circuit description of a design by:

- (a) selecting, from the design, a candidate sub-network that performs several output functions, where the candidate sub-network includes a set of circuit elements;
- (b) generating a parameter based on the output functions;
- (c) using the parameter to retrieve a replacement sub-network from a storage structure that stores replacement sub-networks; and
- (d) replacing the selected candidate sub-network with the replacement sub-network in the design.

Applicants respectfully submit that Jain does not disclose, teach, or even suggest such a method. As mentioned above, Jain discloses a logic verification system for verifying whether two circuits are logically equivalent. Accordingly, Jain does not disclose, teach, or even suggest many of the limitations of the claimed methods of claims 6-30. For instance, Jain does not disclose,

teach, or even suggest replacing in the design a candidate sub-network with a replacement sub-network, which is retrieved from a storage structure based on a parameter that is generated from the output functions performed by the candidate sub-network.

As mentioned above, the paragraph (on column 24, lines 50-65) that was cited for the proposition that Jain discloses a method for replacing one sub-network with another, does not disclose, teach, or even suggest such a replacement. Instead, this paragraph relates to a "successive compose" operation that is part of a process that performs logic design verification through BDD simplification. As this paragraph does not disclose, teach, or even suggest replacing one sub-network in the design with another sub-network, Applicants respectfully submit that Jain neither anticipates nor renders unpatentable any of the claims 6-30. Accordingly, Applicants request reconsideration and withdrawal of the § 102(b) and § 103 rejections of claims 6-30.

#### **V. New Claims 31-43**

In this Amendment, Applicants have added claims 31-43. These claims are computer readable medium claims that are similar to claims 6, 7, 12, 13, 16, 17, and 20-26. Accordingly, Applicants respectfully submit that these claims are patentable over the cited art for the same reasons as stated above for claims 6-30.

## CONCLUSION

In view of the foregoing, it is submitted that all pending claims, namely claims 1-43, are in condition for allowance. Reconsideration of the rejections and objections is requested. Allowance is earnestly solicited at the earliest possible date.

5

Respectfully submitted,

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10

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